Short-Term Program
On
Cutting-Edge Carbon Capture Technologies and Industrial Applications
(Online)

Dec, 15.12.2025 - 20.12.2025 (six days)
09:30 AM to 5:30 PM

Organized by:

Malaviya Mission Teacher Training Centre (MMTTC),
Coimbatore Institute of Technology, Coimbatore -641014
(Government Aided Autonomous Institution Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)

Introduction

Faculty Development Program (FDP) on "**Cutting-Edge Carbon Capture Technologies and Industrial Applications"** provides a comprehensive exploration on Carbon Capture Technology (CCT), also known as Carbon Capture and Storage (CCS),is an advanced environmental engineering process designed to capture carbon dioxide (CO_2) emissions from industrial and energy-related sources before they reach the atmosphere. This technology plays a vital role in mitigating climate change by reducing greenhouse gas emissions from power plants, refineries, cement industries, and other heavy industries.

The program is precisely planned for academicians, researchers' scholars, and industry experts on the lookout for extend in understanding of global strategies to achieve net-zero carbon emissions and supports the transition towards cleaner energy systems.

Key Focus Areas:

- Capture Technologies
- CO_2Utilization
- CO_2 Storage
- Integration with Renewable and Industrial Systems
- Cost Reduction and Scalability
- Policy, Economics, and Public Health

Learning Objectives

- Understanding the principles and importance of carbon capture, utilization, and storage (CCUS) in mitigating climate change.
- Analyzing the latest advancements in carbon capture methods such as post-combustion, pre-combustion, oxy-fuel combustion, and direct air capture (DAC).
- Evaluate industrial integration of carbon technologies in cement, steel, petrochemical, and power generation sectors.
- Explore emerging trends such as AI-driven process optimization, circular carbon economy, and carbon capture from ambient air.
- Design low-cost or modular carbon capture systems suited for small, medium and large scale industries.
- Evaluate policy frameworks, carbon trading, and international initiatives promoting CCUS deployment.

Expected Outcomes categorized as follows:

After successful completion of the workshop, participants will be able to acquire expertise in the following domain:

1**. Knowledge and Awareness**

- Gain a comprehensive understanding of the principles, processes, and importance of carbon capture, utilization, and storage (CCUS) in mitigating climate change.
- Identify the latest technological developments and innovations in carbon capture and conversion methods.
- Understand global trends, challenges, and opportunities in deploying carbon management technologies.

2. Technical Competence

- Demonstrate familiarity with cutting-edge capture techniques such as post-combustion, pre-combustion, oxy-fuel, and direct air capture (DAC).
- Evaluate industrial applications of carbon technologies in power plants, cement, steel, and chemical industries.
- Analyze the performance, efficiency, and limitations of various CO_2 capture and storage systems.

3. Practical and Analytical Skills

- Interpret case studies and pilot projects on industrial carbon capture implementation.
- Develop basic models or flow diagrams representing carbon capture and utilization processes.
- Apply techno-economic and environmental assessment methods to evaluate CCUS projects.

4. **Innovation and Research Orientation**

- Explore emerging research areas such as carbon mineralization, bio-based CO_2 fixation, and carbon-to-fuel conversion.
- Formulate innovative ideas or prototype concepts for low-cost and scalable CCUS technologies.
- Strengthen interdisciplinary collaboration between academia, industry, and government for sustainable carbon solutions.

5. Policy and Industry Insight

- Understand the policy frameworks, carbon pricing, and sustainability goals driving carbon capture deployment.
- Gain awareness of industrial best practices and global case studies demonstrating successful CCUS integration.
- Build capacity to contribute to carbon reduction strategies in professional and research settings.

Programme Schedule *

Date:December 15.12.2025- 20.12.2025,Time: 9.30 a.m to 5.30p.m.

Date	Topics Covered	Mode
15.12.2025	Introduction to Carbon Management & Climate Change	Online
16.12.2025	Carbon Capture Technologies – Current Trends	Online
17.12.2025	Advanced and Emerging Technologies	Online
18.12.2025	CO_2 Transport. Storage and Utilization	Online
19.12.2025	Net Zero Carbon Emission Technologies	Online
20.12.2025	Case studies, Policy and Economic Aspects	Online

*- Detailed Programme Schedule will be provided on 14.12.2025

Resource Persons: *Experts and Eminent Personalities fromIITs,NITs, Premier Institutions and Industries.*

Who Should Attend?

- **HEI** faculty working anywhere in India are eligible to register for the programme.

Prerequisites for Hands-On Activities

Participants should have:

- A **functional laptop/desktop** with an active internet connection.
- A working **webcam, microphone, and Google account** for online sessions.

Benefits: The 6day STP shall be taken into consideration of CAS

How to apply

- No registration fee or participation fee will be collected
- Interested participants are requested to register **on or before 14.12.2025** through the UGC Portal URL https://mmc.ugc.ac.in or G-Form link https://forms.gle/nFZycrHLmHY8sqUNA

Guidelines to the participants

1. Number of participants is limited to 60
2. Selected participants will be intimated through E-mail
3. Participants should upload the permission letter (attached in this brochure) in duly signed by the Head of the Institution / Director.
4. The lecture will be delivered online.
5. There will be an assessment test consisting of multiple-choice questions (MCQs).
6. Only participants who successfully complete the 6-day program and pass the evaluation test will be eligible to receive the certificate.

About CIT & MMTTC

Coimbatore Institute of Technology (CIT) started in 1956 by Sri V. Rangasamy Naidu, is reckoned for its academic excellence in Engineering and Technology. CIT is a Government Aided Autonomous Institution affiliated to Anna University, Chennai. The institute has a reputation with service of competent, well qualified faculty and dynamic management to set highest standards in engineering research and development. CIT offers under graduate, post graduate and Ph.D. programmes with a global standard curriculum promoting the students to compete internationally. Coimbatore Institute of Technology has been granted the Teaching Learning Centre (TLC) under the scheme of Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNMTT), Department of Higher Education, Ministry of Human Resource Development (MHRD) in December, 2017. In 2023, Teaching Learning Centre is renamed as “Malaviya Mission Teacher Training Centre”.

Institute Administration	
Mr. R. Santossh, Managing Trustee / Chairman	Mr.S.Rajiv Rangasami, Correspondent
Dr.A.Rajeswari, Principal	
Contact Details	**Course Coordinators**
Dr.V.Manikandan, Programme Director, MMTTC Coimbatore Institute of Technology Coimbatore - 641 014 Email: mmttc2024@gmail.com	Dr.M.Thirumarimurugan Professor& Head – Chemical Engineering, CIT. Phone :9943549700 Dr.V.M.Sivakumar Associate Professor– Chemical Engineering, CIT. Phone :8489742712 Co Coordinator Dr.B.Uma Maheswari Associate Professor– Chemical Engineering, CIT. Coimbatore - 641 014 Phone : 9944876062

Permission Letter

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Cutting-Edge Carbon Capture Technologies and Industrial Applications
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Mr/Ms/Dr._____ of the Department _____has been permitted to attend the Short-Term Program On "**Cutting-Edge Carbon Capture Technologies and Industrial Applications**" (Online) at MMTTC of Coimbatore Institute of Technology, Coimbatore from December 15-20, 2025.

Name of the College:
Place:
Date:

Signature of Head of the Department	**Signature of Head of the Institution / Director**

** This Permission Letter should be uploaded in the portal
** Participants should attend all the sessions to get certificate